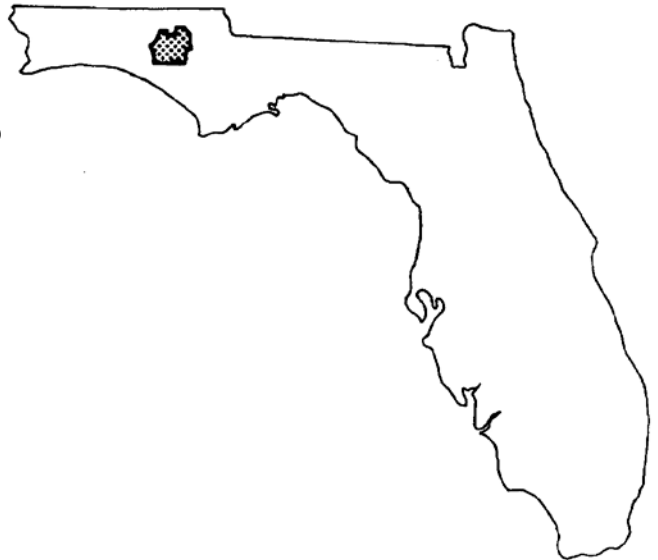


FLOOD INSURANCE STUDY



WASHINGTON COUNTY, FLORIDA AND INCORPORATED AREAS



COMMUNITY NAME	COMMUNITY NUMBER
CARYVILLE, TOWN OF	120321
CHIPLEY, CITY OF	120325
EBRO, TOWN OF	120629
VERNON, CITY OF	120322
WASHINGTON COUNTY (UNINCORPORATED AREAS)	120407
WAUSAU, TOWN OF	120632

REVISED
JULY 4, 2011

Federal Emergency Management Agency



FLOOD INSURANCE STUDY NUMBER
12133CV000A

NOTICE TO FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this FIS may be revised and republished at any time. In addition, part of this FIS may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current FIS components.

Initial Countywide FIS Effective Date: June 17, 1991

Revised Countywide FIS Effective Date: July 4, 2011

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FLOOD INSURANCE STUDY

WASHINGTON COUNTY, FLORIDA AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This countywide Flood Insurance Study (FIS) investigates the existence and severity of flood hazards in, or revises and updates previous FISs/Flood Insurance Rate Maps (FIRMs) for the geographic area of Washington County, Florida, including the Cities of Chipley and Vernon, Towns of Caryville, Ebro and Wausau and the Unincorporated Areas of Washington County (hereinafter referred to collectively as Washington County).

This FIS aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates. This information will also be used by Washington County to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP), and will also be used by local and regional planners to further promote sound land use and floodplain development. Minimum floodplain management requirements for participation in the NFIP are set forth in the Code of Federal Regulations (CFR) at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

This FIS was prepared to include all jurisdictions within Washington County in a countywide FIS. Information on the authority and acknowledgments for each jurisdiction included in this countywide FIS, as compiled from their previously printed FIS reports, is shown below.

The hydrologic and hydraulic analyses for Holmes, Alligator, and Econfinia Creeks; Grassy, Hicks, Lucas, and Dunford Lakes; and portions of the Choctawhatchee River were performed by Engineering Methods and Applications (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-86-C-0109. This study was completed in September 1987.

The hydrologic and hydraulic analyses for the remaining portions of the Choctawhatchee River were taken from the previously published FISs for the City of Caryville and Walton County, Florida (FEMA, 1988; FEMA, 1986).

For this countywide FIS revision, additional hydrologic and hydraulic analyses were prepared for FEMA by URS Corporation under contract with the Northwest Florida Water Management District (NFWFMD), a FEMA Cooperating Technical Partner (CTP).

The digital base map files were derived from Florida Department of Transportation Digital Orthoimagery produced at a resolution of 1 foot from photography dated April 20, 2007.

The coordinate system used for the production of the digital FIRM is State Plane in the Florida North projection zone, referenced to the North American Datum of 1983.

1.3 Coordination

Consultation Coordination Officer's (CCO) meetings may be held for each jurisdiction in this countywide FIS. An initial CCO meeting is held typically with representatives of FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied by detailed methods. A final CCO meeting is held typically with representatives of FEMA, the community, and the study contractor to review the results of the study.

The initial CCO meeting for Washington County and incorporated areas was held on February 5, 1986. The final CCO meeting was then held on June 7, 1990.

For this countywide FIS revision, an initial CCO (Scoping) meeting was held on March 19, 2008 and was attended by representatives of the study contractors, the communities, the NFWFMD and FEMA. A final CCO meeting was held on November 17, 2009.

2.0 **AREA STUDIED**

2.1 Scope of Study

This FIS covers the geographic area of Washington County, Florida. Flooding caused by overflow of Holmes, Alligator, and Econfinia Creeks; the Choctawhatchee River; and Grassy, Hicks, Dunford, and Lucas Lakes was previously studied in detail.

For this countywide FIS, new or revised limited detail hydrologic and hydraulic analyses were included for the flooding sources shown in Table 1 – "Scope of Revision."

TABLE 1 - SCOPE OF REVISION

<u>Stream</u>	<u>Limits of New or Revised Detailed Study</u>
Alligator Creek	From County Road 166 to 3.22 miles upstream of County Road 166.
Bear Bay Creek	From its confluence with Pine Log Creek to approximately 3.90 miles upstream of the confluence with Pine Log Creek
Botheration Creek	From its confluence with Pine Log Creek to approximately 7.70 miles upstream of the confluence with Pine Log Creek
Brock Mill Branch	From its confluence with Jones Rice Mill Branch to approximately 100 feet downstream of State Highway 77
Flat Creek	From its confluence with Hard Labor Creek to approximately 9.73 miles upstream of the confluence with Hard Labor Creek
Hard Labor Creek	From its confluence with Holmes Creek to approximately 15.59 miles upstream of the confluence with Holmes Creek
Helms Branch	From its confluence with Alligator Creek to approximately 3.20 miles upstream of the confluence with Alligator Creek
Johnson Branch	From Roche Avenue to approximately 3.8 miles upstream of the confluence with Holmes Creek
Jones Rice Mill Branch	From its confluence with Holmes Creek to approximately 5.87 miles upstream of the confluence with Holmes Creek
Pine Log Creek	From approximately 1.88 miles above its confluence with East River to approximately 16.56 miles upstream of the confluence with East River
Piney Branch	From its confluence with Holmes Creek to approximately 6.61 miles upstream of the confluence with Holmes Creek
Pippin Mill Creek	From its confluence with Holmes Creek to just downstream of County Road 280
Reedy Creek	From its confluence with Hard Labor Creek to approximately 3.76 miles upstream of the confluence with Hard Labor Creek
Unnamed Tributary 1 to Alligator Creek	From approximately 900 feet upstream of State Highway 277 to approximately 1.24 miles upstream of State Highway 277

TABLE 1 - SCOPE OF REVISION – cont.

<u>Stream</u>	<u>Limits of New or Revised Detailed Study</u>
Unnamed Tributary 2 to Alligator Creek	From its confluence with Alligator Creek to approximately 2.23 miles upstream of the confluence with Alligator Creek
Unnamed Tributary 3 to Alligator Creek	From its confluence with Alligator Creek to approximately 1.97 miles upstream of the confluence with Alligator Creek
Unnamed Tributary to Helms Branch	From 300 feet downstream of Brickyard Road to approximately 0.57 miles upstream of Brickyard Road
Unnamed Tributary to Holmes Creek	From its confluence with Holmes Creek to approximately 2.20 miles upstream of the confluence with Holmes Creek
Unnamed Tributary to Holmes Creek East Branch	From its confluence with Unnamed Tributary to Holmes Creek to approximately 1.26 miles upstream of the confluence with Unnamed Tributary to Holmes Creek

The areas studied by detailed methods or limited detailed methods were selected with priority given to all known flood hazards and areas of projected development and proposed construction.

All or portions of numerous flooding sources in the county were studied by approximate methods. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed upon by FEMA, the NFWFMD, and Washington County.

2.2 Community Description

Washington County occupies an area of 597 square miles in the Central Florida Panhandle. The county is bordered on the north by Holmes County and the Towns of Westville and Ponce De Leon, Florida; on the east by Jackson County, Florida; on the south by Bay County, Florida; and on the west by Walton County, Florida. Washington County is served by Interstate 10; U.S. Route 90; State Roads 8, 10, 20, 77, and 79; and CSX railroad. The 2008 population estimate for the county was reported to be 23,928 (U.S. Census Bureau, 2008).

The economy of Washington County is based largely on agriculture and forest products. Other than agriculture, the main industries are wood and wood-related products.

Land elevations in Washington County range from near sea level in the extreme southwest near the mouth of the Choctawhatchee River, to approximately 300 feet

North American Vertical Datum of 1929 (NAVD), in the eastern regions. The topography is mostly gently sloping and composed of a series of ancient marine and river terraces. The soils are sandy and loamy; most areas of the county are covered with a thin layer of sandy sediments varying in thickness from a few inches to more than 30 feet (U.S. Department of Agriculture, 1965).

The climate in Washington County is characterized by long, warm, humid summers and mild winters. Maximum and minimum temperatures are moderated by the Gulf of Mexico, the daily average temperature being about 51 degrees Fahrenheit (°F) in January and 81°F in July; the annual mean temperature is about 67°F (U.S. Department of Agriculture, 1965). The average annual rainfall is about 60 inches (U.S. Department of Agriculture, 1965). The periods of heaviest rainfall are early March through late April and mid-June through mid-September. The period of least rainfall is generally the months of October and November.

2.3 Principal Flood Problems

In general, Washington County is not extremely floodprone. In fact, severe drought can be as problematic as flooding, with recent droughts being experienced in 1954-56, 1968, and 1977 (U.S. Army Corps of Engineers [USACE], 1980). Nevertheless, occasional, severe floods can and do occur within the county.

Flooding in Washington County results from overflow of streams, local ponding, and sheetflow. Major rainfall events are associated with either tropical storms or frontal and thunderstorm systems. Ninety percent of floods occur in the period of December through April with March and April being the most hazardous months; the largest flood on record in the county occurred during March 1929. Other major floods occurred in April 1960 and April 1975.

Rainfall associated with hurricanes can typically amount to as much as 12 inches in the area. Twelve such hurricanes affected the county between 1915 and 1975 (USACE, May 1980). The maximum storm rainfall recorded from northwest Florida was 24.5 inches measured at Bonifay (just north of Washington County) in July 1916. A March 1929 storm caused the most severe general flooding in northwest Florida, with peak rainfall northwest of Washington County in southern Alabama amounting to 30 inches. In 1979, another March storm brought 18 inches of rain in 18 hours to Pensacola southwest of the county (USACE, 1980).

At the 1-percent annual chance level, flooding will occur in many developed areas adjacent to the Washington County rivers and streams. Still other areas, such as those around Grassy, Hicks, Dunford, and Lucas Lakes, are subject to flooding associated with simple ponding.

The March 1929 flood at Caryville where flood stage is 53.7 feet NAVD 88 reached a stage of over 66 feet NAVD88, exceeding the 1-percent annual chance level by about 6 feet (USACE, 1979). The flood of April 1928 reached 59.7 feet NAVD 88 equaling the 100-year level. A major flood (1975) produced a stage of over 56.7 feet NAVD 88.

2.4 Flood Protection Measures

Flood protection measures are not known to exist within the study area.

3.0 **ENGINEERING METHODS**

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this FIS. Flood events of a magnitude that is expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this FIS. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for the flooding sources studied in detail affecting the county.

June 17, 1991 Countywide Analyses

For Holmes Creek and Alligator Creek, discharges were determined using USGS regional equations. A log-Pearson III analysis of the gage at Vernon was also utilized for Holmes Creek (USACE, 1983, with updates).

Revised Countywide Analyses

For this countywide FIS, the streams listed below were analyzed by limited detail methods.

Alligator Creek	Piney Branch
Bear Bay Creek	Pippin Mill Creek
Botheration Creek	Reedy Creek
Brock Mill Branch	Unnamed Tributary 1 to Alligator Creek
Flat Creek	Unnamed Tributary 2 to Alligator Creek
Hard Labor Creek	Unnamed Tributary 3 to Alligator Creek
Helms Branch	Unnamed Tributary to Helms Branch
Johnson Branch	Unnamed Tributary to Holmes Creek
Jones Rice Mill Branch	Unnamed Tributary to Holmes Creek
Pine Log Creek	East Branch

Streamflows for each of the limited detail study reaches were estimated using USGS Regional Regression Equations for a series of flood frequencies. Flood frequency methods were used to estimate streamflows at USGS gages within and adjacent to Washington County on streams with characteristics similar to those of the study reaches. Estimated streamflows for each of the study reaches (both methods) were compared to a log plot of discharge versus drainage area for the gage estimates, and assessed against their fit within confidence limits representing plus or minus one standard deviation for a normal distribution. The comparison was conducted for all flood frequencies determined as part of this assessment.

USGS Regional Regression Equations developed for use in this study were based on methodologies and equations presented in detail in USGS, Water Resources Investigations 82-4012, Technique for Estimating Magnitude and Frequency of Floods on Natural-Flow Streams in Florida, 1982. The National Flood Frequency (NFF) Program, Version 3, was used compute streamflow estimates for this analysis.

Drainage basin maps for the study areas were prepared using GIS. Input data required for the regression equation estimates, including Drainage Area, Channel Slope and Lake Area, were all determined using GIS based data.

Peak discharge-drainage area relationships for the 10-, 2-, 1-, and 0.2-percent annual chance floods of each flooding source studied by detailed or limited detail methods in the community are shown in Table 2 – “Summary of Discharges.”

TABLE 2 - SUMMARY OF DISCHARGES

<u>FLOODING SOURCE AND LOCATION</u>	<u>DRAINAGE</u>	<u>PEAK DISCHARGE (CFS)</u>			
	<u>AREA</u> <u>(SQ MILES)</u>	<u>10-</u> <u>PERCENT</u>	<u>2-</u> <u>PERCENT</u>	<u>1-</u> <u>PERCENT</u>	<u>0.2-</u> <u>PERCENT</u>
ALLIGATOR CREEK					
At mouth	101	4,720	8,400	10,300	15,700
Just upstream of U.S. Route 90	98	4,660	8,300	10,200	15,500
Just upstream of County Road 166	90	4,450	8,000	9,700	14,800
At Old Bonifay Road	85.2	3,951	6,936	8,421	12,564
CHOCTAWHATCHEE RIVER					
Just downstream of U.S. Route 90	3,499	N/A	N/A	133,000	N/A
BEAR BAY CREEK					
At confluence with Pine Log Creek	16.9	936	1,496	1,743	2,368
BOTHERATION CREEK					
At confluence with Pine Log Creek	22.0	1,998	3,648	4,471	6,760
BROCK MILL BRANCH					
At confluence with Jones Rice Mill Br.	8.0	564	920	1,076	1,467
FLAT CREEK					
At confluence with Hard Labor Creek	24.5	2,149	3,895	4,759	7,156
HARD LABOR CREEK					
At confluence with Holmes Creek	118.4	4,281	7,315	8,807	12,926
HELMS BRANCH					
At confluence with Alligator Creek	5.3	427	692	807	1,096
JOHNSON BRANCH					
At confluence with Holmes Creek	3.8	853	1,638	2,028	3,107
JONES RICE MILL BRANCH					
At confluence with Holmes Creek	12.5	800	1,284	1,496	2,031
PINE LOG CREEK					
At confluence with East River	97.0	3,080	5,298	6,368	9,282
PINEY BRANCH					
At confluence with Holmes Creek	5.3	712	1,250	1,500	2,157

TABLE 2 - SUMMARY OF DISCHARGES

<u>FLOODING SOURCE AND LOCATION</u>	<u>DRAINAGE AREA (SQ MILES)</u>	<u>PEAK DISCHARGE (CFS)</u>			
		<u>10- PERCENT</u>	<u>2- PERCENT</u>	<u>1- PERCENT</u>	<u>0.2- PERCENT</u>
PIPPIN MILL CREEK					
At confluence with Holmes Creek	11.0	1,025	1,774	2126	3,058
REEDY CREEK					
At confluence with Hard Labor Creek	10.8	1,558	2,903	3,567	5,409
UNNAMED TRIBUTARY 1 TO ALLIGATOR CREEK					
Just upstream of County Road 277	0.8	144	237	276	370
UNNAMED TRIBUTARY 2 TO ALLIGATOR CREEK					
At confluence with Alligator Creek	3.0	379	635	748	1,032
UNNAMED TRIBUTARY 3 TO ALLIGATOR CREEK					
At confluence with Alligator Creek	1.0	173	287	335	454
UNNAMED TRIBUTARY TO HELMS BRANCH					
At Brickyard Road	0.8	100	153	174	221
UNNAMED TRIBUTARY TO HOLMES CREEK					
At confluence with Holmes Creek	4.4	651	1,154	1,389	2,009
UNNAMED TRIBUTARY TO HOLMES CREEK EAST BRANCH					
At confluence with Unnamed Tributary to Holmes Creek	2.0	587	1,070	1,298	1,906
HOLMES CREEK					
Just upstream of Shell Landing Ferry	452	9,240	15,700	19,000	28,300
Just upstream of Miller's Ferry	444	9,090	15,500	18,700	27,800
Approximately 700 feet downstream of confluence of Chapel Branch	428	8,980	15,300	18,500	27,500
Just upstream of Washington County Boat Ramp	404	8,560	14,600	17,600	26,100
Just upstream of State Road 79	386	8,190	13,900	16,800	24,800

Elevations for floods of the selected recurrence intervals of Grassy, Hicks, Dunford, and Lucas Lakes are shown in Table 3 – “Summary of Stillwater Elevations.”

TABLE 3 - SUMMARY OF STILLWATER ELEVATIONS

<u>FLOODING SOURCE AND LOCATION</u>	<u>PEAK ELEVATION (FEET NAVD 88) 1-PERCENT ANNUAL CHANCE</u>
DUNFORD LAKE	
Along entire shoreline	76.7
GRASSY LAKE	
Along entire shoreline	83.7
HICKS LAKE	
Along entire shoreline	76.7
LUCAS LAKE	
Along entire shoreline	76.7

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. For construction and/or floodplain management purposes, users are encouraged to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

June 17, 1991 Countywide Analyses

Cross sections were obtained from field surveys and topographic maps (USGS, 7.5 Minute Series Topographic Maps). Bridges and culvert geometry were also obtained from field survey. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles and on the FIRM.

Roughness coefficients (Manning’s “n”) were based on field observations, aerial photos, and photographs of the streams and floodplain areas. Values ranged from 0.03 to 0.06 for the channels and from 0.06 to 0.15 for the overbank areas.

For Holmes and Alligator Creeks, water surface elevations were computed using HEC-2 (USACE, 1984). Starting water-surface elevations were computed at normal depth.

For the Choctawhatchee River, the 1-percent annual chance profile was obtained by interpolation between the USGS gage (No. 02355600) near State Road 20 and the

gage (No. 02365500) at Caryville. The stage-discharge relation for the gage at Caryville is defined by current meter measurement to a discharge of 85,000 cfs and extended to 206,000 cfs on the basis of a slope/area measurement. The 1-percent annual chance flood elevation at the gage is 60.2 feet NAVD 88. A stage-discharge relation was determined at the Interstate 10 crossing, 1.9 stream miles downstream from the gage (U.S. Department of the Interior, 1966 (unpublished)). The 1-percent annual chance flood elevation is 57.9 feet NAVD 88 at Interstate 10, or 2.3 feet lower than at the gage. The 1-percent annual chance flood elevation was projected upstream to the north corporate limits using this same slope.

Three independent high-water marks from the 1975 flood were recovered. Two of these marks were on the Cypress Slough side of County Highway 279 and the other on the Choctawhatchee River side. The 1975 flood was plotted at the same slope as that used for the 1-percent annual chance flood. The three high-water marks were then plotted on the profile at their respective locations. All three marks fall within 0.2 foot of the 1975 flood profile; therefore, the computed slope and the assumption that the water level in Cypress Slough is the same as in the Choctawhatchee River should be valid.

The elevations on Holmes Creek, upstream of the City of Vernon, Florida, were obtained by interpolation techniques between the end of the detailed study north of Vernon and the detailed study for the City of Graceville, Florida (USGS, 1985). The 1-percent annual chance profile on Econfinia Creek was obtained by interpolation between the USGS gaging stations near Fountain (No. 02359450) and Bennett (No. 02359500). Ponding near Grassy, Hicks, Lucas, and Dunford Lakes was estimated by water budget methods.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. In cases where the 2- and 1-percent annual chance flood elevations are close together, due to limitations of the profile scale, only the 1-percent annual chance profile has been shown.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Revised Countywide Analyses

For this countywide FIS, the areas presented below were studied by limited detail methods to estimate flood elevations for the selected recurrence intervals.

The Bear Bay Creek reach extends from its confluence with Pine Log Creek to approximately 3.9 miles upstream near Ebro, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 8 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and

underbrush causing a high degree of roughness. This reach does not have any bridge or culvert crossings.

The Botheration Creek reach extends from its confluence with Pine Log Creek to approximately 7.5 miles upstream near Ebro, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 8 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach does not have any bridge or culvert crossings.

The Brock Mill Branch extends from its confluence with Jones Rice Mill Branch to approximately 5 miles upstream near the intersection with State Highway 77. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 12 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has one bridge crossings and four culvert crossings.

The Flat Creek reach extends from the confluence with Hard Labor Creek to approximately 9.7 miles upstream. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 11 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has five bridge crossing and two culvert crossings.

The Hard Labor Creek Study Area includes Hard Labor Creek, Flat Creek, and Reedy Creek study reaches located south of the Chipley, Florida. The Hard Labor Creek reach extends from the confluence with Homes Creek to approximately 15.6 miles upstream. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 5 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has five bridge crossings.

Helms Branch reach extends from its confluence with Alligator Creek to approximately 2.82 miles upstream. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 5 feet per mile. The channel for all the reaches contained in the Alligator Creek Study Area, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. Alligator

Creek has two bridge crossings. Unnamed Tributary 3 to Alligator Creek has 6 culvert crossings and two in-line weirs located upstream and downstream of an unnamed pond. Helms Branch has two bridge crossings and three culvert crossings.

The Jones Rice Mill Branch extends from its confluence with Holmes Creek to approximately 5.9 miles upstream. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 17 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has two bridge crossings and five culvert crossings.

The Alligator Creek Study Area includes Alligator Creek, Unnamed Tributary 3 to Alligator Creek, and Helms Branch study reaches. The Alligator Creek consists of a segment of the Alligator Creek from County Road 166, Chipley, Florida and going upstream approximately 3.51 miles in length near the Washington County border with Jackson County. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 3 feet per mile.

The Unnamed Tributary 1 to Alligator Creek study reach comprises a segment of the creek beginning at an area located west of the intersection of State Highway 277 and Brickyard Road near Chipley, Florida and going upstream approximately 1.24 miles in length to an unnamed pond located southwest of the intersection of Hutchinson Road and Sorrells Road near Chipley, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 44 feet per mile. The channel, which has a sandy bottom in the upper reach as well as Bladen and Bayboro soils at the bottom in the lower reach, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has two culvert crossings.

The Unnamed Tributary 2 to Alligator Creek reach extends from its confluence with Alligator Creek to approximately 2.23 miles upstream and south of the intersection with County Road 280 near Chipley, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 18 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has five culvert crossings and one bridge crossing.

The Unnamed Tributary 3 to Alligator Creek reach extends from its confluence with Alligator Creek to approximately 1.97 miles upstream directly north of the

intersection with County Road 166. The channel and floodplain areas throughout the study reach are primarily forested and residential with an average channel slope of about 14 feet per mile.

The Unnamed Tributary to Helms Branch reach extends from approximately 300 feet north of County Road 280/Brickyard Road to approximately 0.63 miles upstream near Chipley, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 13 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has one culvert crossing structure.

The Unnamed Tributary to Holmes Creek reach extends from its confluence with Holmes Creek to approximately 2.2 miles upstream near Vernon, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 14 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has six culvert crossings.

The Unnamed Tributary to Holmes Creek East Branch reach extends from its confluence with Unnamed Tributary to Holmes Creek to approximately 1.26 miles upstream near Vernon, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 13 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has two culvert crossings.

The Pine Log Creek Study Area includes Pine Log Creek, Botheration Creek, and Bear Bay Creek study reaches. The Pine Log Creek reach extends from approximately 1.88 miles upstream from the confluence with the East River to approximately 14.68 miles upstream to the confluence with Bear Bay Creek near Ebro, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 2 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has two bridge crossings.

The Piney Branch reach extends from its confluence with Holmes Creek to approximately 6.61 miles upstream near Vernon, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 25 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to

appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has four culvert crossings.

The Pippin Mill Creek extends from its confluence with Holmes Creek to approximately 5.21 miles upstream and south of the intersection with County Road 280 near Chipley, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 13 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has one bridge crossing and one culvert crossing.

The Reedy Creek reach extends from the confluence with Hard Labor Creek to approximately 3.8 miles upstream. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 13 feet per mile. The channel, which has a sandy bottom, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has one bridge crossing and six culvert crossings.

HEC-RAS models were developed to simulate flood elevations. Each model included details of natural channel geometry and considered all structures which potentially impact flood levels such as bridges and culverts. Channel cross-sections were obtained from LiDAR topographic data for Washington County topographic data. Bridge and culvert structures were field reviewed to obtain estimated elevation data and structural geometry. Available bridge and culvert structure data was also obtained from FDOT and Washington County.

Channel and floodplain roughness coefficients (Manning's "n") were estimated based upon the methodology documented in USGS Water Supply Paper 2339. A combination of field observation, photographs, and aerial photography was used to establish the parameters used in the methodology. Roughness values for the main channels ranged from 0.035 to 0.05, and overbank values ranged from 0.050 to 0.10 for the streams studied in limited detail in this revised analysis.

The starting water surface elevations for the HEC-RAS models were determined using either normal depth or known water surface elevations for areas that were a continuation of the previous FIS. No floodways were determined for the streams in this study using limited detailed methods.

Elevations for floods of the selected recurrence interval for the limited detailed studies for Washington County are shown in Table 4 – "Limited Detailed Flood Hazard Data."

All qualifying bench marks within a given jurisdiction that are cataloged by the National Geodetic Survey (NGS) and entered into the National Spatial Reference System (NSRS) as First or Second Order Vertical and have a vertical stability classification of A, B, or C are shown and labeled on the FIRM with their 6-character NSRS Permanent Identifier.

Bench marks cataloged by the NGS and entered into the NSRS vary widely in vertical stability classification. NSRS vertical stability classifications are as follows:

- Stability A: Monuments of the most reliable nature, expected to hold position/elevation well (e.g., mounted in bedrock)
- Stability B: Monuments which generally hold their position/elevation well (e.g., concrete bridge abutment)
- Stability C: Monuments which may be affected by surface ground movements (e.g., concrete monument below frost line)
- Stability D: Mark of questionable or unknown vertical stability (e.g., concrete monument above frost line, or steel witness post)

In addition to NSRS bench marks, the FIRM may also show vertical control monuments established by a local jurisdiction; these monuments will be shown on the FIRM with the appropriate designations. Local monuments will only be placed on the FIRM if the community has requested that they be included, and if the monuments meet the aforementioned NSRS inclusion criteria.

To obtain current elevation, description, and/or location information for bench marks shown on the FIRM for this jurisdiction, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their Web site at www.ngs.noaa.gov.

It is important to note that temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with this FIS and FIRM. Interested individuals may contact FEMA to access this data.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
ALLIGATOR CREEK			
G	22,223	8,421	75.5
H	22,621	8,421	75.5
I	23,011	8,421	75.6
J	23,897	8,421	75.7
K	24,808	8,421	75.7
L	25,520	8,421	75.8
M	25,832	8,421	75.8
N	26,872	8,631	76.0
O	27,689	8,513	76.1
P	28,539	8,513	76.3
Q	29,260	8,513	76.6
R	29,985	8,513	76.9
S	30,800	8,513	77.2
T	31,511	8,513	77.5
U	32,223	8,513	77.7
	32,628	8,413	77.8
	33,253	7,970	78.0
V	34,239	7,970	78.4
W	35,126	7,970	78.8
X	35,236	7,970	78.9
Y	35,348	7,970	79.4
Z	35,439	7,970	79.5
AA	36,035	7,970	79.6
AB	36,769	7,970	79.8
AC	37,576	7,970	80.1
AD	38,366	7,970	80.3
AE	39,237	7,970	80.8
BEAR BAY CREEK			
A	898	1,743	44.3 ³
	1,863	1,170	44.3 ³
	3,104	1,170	44.3 ³
	4,170	1,170	44.4
B	5,288	1,170	45.3

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
BEAR BAY CREEK – cont.			
	6,032	1,170	46.9
	6,642	1,170	48.1
	7,353	1,170	49.0
C	8,017	1,170	50.0
	8,743	1,170	51.6
	9,402	1,170	53.2
	10,060	1,170	55.7
D	10,873	1,170	58.3
	11,447	812	59.3
	12,215	812	60.1
	13,225	812	61.1
E	14,176	812	62.6
	15,338	812	66.7
	16,103	812	68.6
	16,952	812	69.3
F	17,811	461	69.9
	18,656	461	71.9
	19,633	461	74.7
G	20,636	461	76.4
BOTHERATION CREEK			
A	1,010	4,471	32.8
	2,055	4,471	33.8
	3,064	4,471	35.0
	4,172	4,471	36.0
B	5,223	4,471	36.9
	5,926	4,471	37.4
	7,052	4,471	38.8
	7,510	4,064	39.4
C	8,427	4,064	40.3
	9,481	4,064	41.7
	10,556	4,064	43.0
	11,602	4,064	44.1
D	12,885	3,893	45.3
	14,194	3,893	46.6

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
BOTHERATION CREEK – cont.			
	14,947	3,893	47.3
	15,513	3,893	48.1
E	16,314	3,893	48.8
	17,057	3,893	49.3
	17,813	3,893	50.0
	18,757	3,893	51.1
F	19,922	3,893	52.4
	20,778	3,893	53.7
	21,432	2,384	55.2
	21,920	2,384	56.2
G	22,424	2,384	57.2
	23,217	2,384	58.5
	23,934	2,384	59.5
	24,371	2,384	60.4
H	25,143	2,384	61.8
	25,560	2,384	62.6
	26,039	2,384	63.5
	26,548	2,384	64.4
I	27,224	2,384	65.7
	27,895	2,384	67.0
	28,677	2,384	68.2
	29,231	2,384	69.4
J	29,950	2,384	70.8
	30,667	1,733	72.3
	31,354	1,733	73.4
	31,987	1,733	74.0
K	32,670	1,733	74.7
	33,705	972	76.6
	34,631	972	78.4
	35,364	972	79.9
L	36,225	763	81.2
	36,808	763	82.3
	37,955	763	84.3
	38,722	763	86.2

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
BOTHERATION CREEK – cont.			
M	39,417	763	87.2
	40,050	156	89.2
N	40,678	156	90.0
BROCK MILL BRANCH			
A	270	1,076	54.4 ³
	335	1,076	54.4 ³
	379	1,076	55.2
B	469	1,076	55.2
	1,249	1,076	55.3
C	2,014	1,076	55.3
	2,756	1,076	55.3
D	3,545	1,076	55.3
E	4,403	1,076	55.3
	5,028	1,076	55.4
F	5,565	1,076	56.9
G	6,336	1,076	59.2
H	6,768	1,076	60.3
	6,865	1,076	61.2
	6,956	1,076	65.4
I	7,070	1,076	65.4
J	7,937	1,076	65.5
K	9,010	1,076	65.5
L	9,662	1,076	65.4
M	10,477	1,076	66.3
N	10,599	1,076	66.6
O	10,696	1,076	67.4
P	10,900	1,076	68.3
Q	11,744	1,076	68.9
R	12,641	1,076	71.3
S	13,206	1,076	71.7
T	13,875	1,076	72.1
	14,210	1,076	72.5
	14,279	1,076	78.5
U	14,546	977	78.5

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
BROCK MILL BRANCH – cont.			
V	15,774	977	78.5
W	16,567	578	78.5
X	17,671	578	78.5
Y	18,161	578	79.5
Z	18,875	578	81.6
AA	19,826	578	84.2
	20,022	578	84.8
	20,096	578	90.2
AB	20,308	578	90.2
AC	20,808	578	90.2
AD	21,511	578	90.2
AE	22,109	578	90.3
AF	22,923	578	94.5
AG	23,477	578	97.3
AH	24,083	578	98.9
AI	24,508	578	101.0
AJ	25,237	578	105.1
AK	25,904	578	107.2
AL	26,465	578	109.1
FLAT CREEK			
A	2,825	4,759	51.8
	3,824	4,609	52.9
B	5,981	4,609	55.1
	7,960	4,609	56.8
C	8,824	4,609	57.9
D	9,058	4,609	59.6
	9,568	4,609	59.9
	10,929	4,609	60.4
E	12,257	4,609	62.4
	13,928	4,609	64.6
	15,333	4,609	65.9
F	16,432	4,609	67.4
G	16,777	4,609	71.8
	18,025	4,214	71.9

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
FLAT CREEK – cont.			
H	19,227	4,214	72.4
I	21,235	3,463	76.4
J	21,402	3,463	78.5
	22,092	3,463	78.7
	24,196	3,463	82.0
K	25,853	3,463	86.4
	27,015	3,463	89.2
L	28,016	3,463	90.6
M	28,206	2,731	91.6
	28,914	2,731	91.8
	29,953	2,731	92.8
N	31,069	2,731	95.0
	32,496	2,273	99.1
	33,691	2,273	101.3
O	34,673	2,273	102.4
P	34,844	2,273	106.6
	35,274	2,273	106.6
Q	35,718	2,273	106.9
R	35,878	2,273	110.6
	37,367	2,273	110.8
S	38,568	1,973	112.7
	39,829	1,251	115.8
T	41,042	1,251	119.1
	42,714	1,145	125.0
	44,362	1,145	129.8
U	45,033	1,039	133.3
V	45,256	1,039	135.1
	45,668	1,039	135.2
	45,983	1,039	135.6
	46,559	1,039	137.6
	47,323	1,039	140.0
W	48,007	1,039	144.5
	48,749	1,039	147.3
	49,202	1,039	150.2

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
FLAT CREEK – cont.			
	49,700	1,039	152.3
X	50,219	1,039	154.4
	50,967	1,039	158.9
Y	51,352	1,039	160.0
HARD LABOR CREEK			
	511	8,807	42.5 ⁴
	3,663	7,696	42.5 ³
A	4,088	7,696	42.5 ³
	4,861	7,696	42.5 ³
B	7,020	7,696	42.7
C	9,653	7,696	44.6
	12,000	7,696	46.8
D	13,689	7,696	48.0
E	14,068	7,696	48.6
	15,594	7,696	49.1
F	18,743	5,249	50.2
G	22,257	6,064	51.4
H	24,562	6,064	53.8
I	27,231	6,064	55.4
J	27,662	6,064	56.2
K	29,489	6,064	57.2
L	33,597	5,857	59.2
	35,398	5,857	60.3
M	38,283	5,857	61.4
	40,578	5,857	62.3
N	43,965	5,857	66.3
O	44,378	5,857	67.5
	45,215	5,857	67.9
P	46,372	5,857	68.1
	48,524	5,857	69.3
	51,866	5,246	75.8
Q	53,617	5,246	76.2
	55,975	5,246	76.5
	58,241	5,246	78.5

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
HARD LABOR CREEK – cont.			
	60,472	3,849	79.4
R	62,074	3,849	81.4
S	65,156	3,849	90.7
	66,736	3,849	93.8
T	67,426	3,849	97.1
U	67,585	3,849	100.1
	67,953	3,849	100.5
	69,382	3,849	101.1
V	71,556	3,849	104.4
	74,008	1,821	107.0
	74,919	1,339	107.2
W	76,213	1,195	107.6
	77,995	1,195	108.3
X	79,290	747	108.7
	81,348	747	109.4
Y	82,295	747	114.3
HELMS BRANCH			
	955	807	77.7 ³
	1,258	807	77.7 ³
A	1,578	807	77.7 ³
B	2,397	807	77.7 ³
C	2,931	807	77.7 ³
	3,673	807	77.7 ³
D	4,007	807	77.7 ³
	4,399	751	77.7 ³
E	5,070	751	77.7 ³
	5,600	751	77.7 ³
F	6,511	751	77.7 ³
G	7,406	751	77.7 ³
H	7,966	806	77.9
I	8,522	806	78.4
	8,782	806	78.6
	8,876	806	79.0
J	9,095	806	79.3

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
HELMS BRANCH – cont.			
	9,323	806	79.5
K	9,912	806	79.8
	10,356	806	79.9
	10,431	806	83.0
L	10,680	806	83.0
	11,268	618	83.1
M	11,665	618	83.1
N	11,958	618	83.2
	12,319	618	83.3
O	12,400	618	83.4
	12,529	618	83.7
P	12,757	530	83.8
	13,026	530	84.1
Q	13,254	530	84.2
	13,508	530	84.3
R	13,629	530	84.9
	13,755	530	84.9
S	14,102	530	85.0
T	14,586	530	85.3
	14,672	530	85.4
	14,731	530	87.7
U	14,969	530	87.7
V	15,682	530	87.8
W	16,358	554	88.4
X	16,904	554	88.8
JOHNSON BRANCH			
	0	2,028	37.2 ³
	654	2,028	37.2 ³
	1,127	2,028	37.2 ³
	1,262	2,028	37.2 ³
A	1,364	2,028	38.1
B	1,626	2,028	38.1
C	2,300	2,028	38.2
D	3,262	2,028	38.8

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
JOHNSON BRANCH – cont.			
E	4,053	2,028	40.0
F	4,998	1,066	40.5
G	6,086	1,066	40.8
H	7,260	1,066	43.6
I	8,315	1,066	46.1
J	9,183	1,066	47.2
K	9,889	1,066	48.5
L	10,920	1,066	52.5
	11,065	1,066	53.1
	11,151	1,066	57.0
M	11,204	1,066	57.0
	11,860	1,066	57.1
	11,985	1,066	57.1
N	12,082	1,066	57.9
O	12,301	1,066	57.9
P	12,957	1,066	59.2
Q	13,646	1,066	62.8
R	14,694	1,066	67.8
S	15,484	1,066	71.7
T	16,085	832	74.3
	16,342	832	76.5
U	16,463	832	79.2
	16,662	832	79.2
V	17,395	832	83.5
W	18,114	832	89.1
X	18,664	832	91.6
	18,909	832	92.2
Y	19,020	832	94.1
Z	19,135	832	94.2
	19,339	832	94.5
AA	19,550	832	95.0
	19,661	832	97.3
	19,728	832	101.2
	19,791	832	101.2

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
JOHNSON BRANCH – cont.			
AB	19,887	832	101.2
JONES RICE MILL BRANCH			
	57	1,496	53.2 ³
	1,056	1,496	53.2 ³
	1,933	1,496	53.2 ³
	2,940	1,496	53.2 ³
	3,591	1,496	53.2 ³
	3,674	1,496	53.2 ³
A	3,843	1,496	53.6
B	3,912	1,496	53.8
	4,388	1,496	54.0
	4,858	1,496	54.3
	5,485	799	54.4
	6,168	799	54.4
C	6,801	799	54.4
	7,682	799	54.4
D	8,686	799	60.0
	8,867	799	60.5
E	8,970	799	64.3
	9,153	799	64.3
F	9,709	799	64.3
	10,213	799	64.3
G	10,602	799	64.3
H	11,242	799	64.4
I	11,703	799	64.4
	11,795	799	64.4
	11,875	799	65.1
J	11,988	799	65.1
	12,349	799	65.1
K	13,212	799	65.3
L	14,145	799	65.6
M	14,949	638	68.5
	15,220	638	70.9
	15,306	638	74.4

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
JONES RICE MILL BRANCH – cont.			
N	15,442	638	74.4
O	16,077	638	74.4
P	16,956	638	74.4
Q	17,828	638	74.4
R	18,039	638	74.4
	18,297	638	74.4
	18,420	638	74.7
S	18,629	638	74.7
T	19,585	638	74.7
U	20,520	522	78.4
V	21,473	522	80.5
W	22,548	522	83.7
X	23,369	522	86.3
	24,367	522	90.8
Y	25,259	522	93.5
Z	26,064	522	96.9
AA	26,773	522	102.9
AB	27,509	522	107.5
AC	28,262	522	112.7
	28,566	522	113.6
	28,647	522	117.9
AD	28,715	522	117.9
AE	29,134	522	118.6
AF	29,602	522	123.9
	29,679	522	126.2
	29,728	522	127.6
AG	29,804	522	128.7
AH	30,432	522	138.1
AI	30,999	522	145.5
PINE LOG CREEK			
	9,935	6,368	21.0 ³
A	10,566	6,368	21.0 ³
	11,377	6,368	21.0 ³
	12,586	6,368	21.0 ³

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
PINE LOG CREEK – cont.			
	13,831	6,368	21.0 ³
B	15,528	6,368	21.0 ³
	17,603	6,368	21.0 ³
	18,853	6,368	21.0 ³
	20,291	6,368	21.0 ³
C	20,874	6,368	21.0 ³
	21,777	6,368	21.0 ³
	23,224	6,368	21.0 ³
	24,582	6,368	21.0 ³
D	25,948	6,368	21.0 ³
	26,908	6,368	21.0 ³
	28,065	6,368	21.0 ³
	29,676	6,368	21.0 ³
E	30,686	6,368	21.0 ³
	32,160	6,368	21.0 ³
	32,945	6,368	21.0 ³
	33,949	6,368	21.0 ³
F	35,396	6,368	21.0 ³
F	35,396	6,368	21.0 ³
	35,897	6,368	21.0 ³
G	36,390	6,368	21.0 ³
H	36,598	6,368	21.0 ³
	36,991	6,368	21.0 ³
	38,148	6,368	21.0 ³
	39,212	6,368	21.0 ³
I	40,289	6,368	21.0 ³
	41,286	6,368	21.0 ³
	42,268	6,368	21.0 ³
	43,270	6,368	21.0 ³
J	44,419	6,368	21.0 ³
	45,477	6,368	21.0 ³
	46,266	6,368	21.0 ³
	47,301	6,368	21.0
K	48,369	6,368	21.6

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
PINE LOG CREEK – cont.			
	49,372	6,368	22.1
	50,708	6,368	23.1
	51,701	6,368	23.6
L	53,052	6,368	24.1
	54,014	6,368	24.5
	55,019	6,368	24.9
	55,864	6,368	25.5
M	56,790	6,368	26.4
	57,574	6,368	26.8
	58,406	6,368	27.2
	59,661	6,368	28.0
N	59,929	6,368	28.1
O	60,054	6,368	28.3
	60,280	6,368	28.5
	60,942	6,368	28.7
	61,503	6,368	29.1
	62,542	6,368	29.8
P	63,529	6,368	30.2
	64,743	6,368	30.7
	65,832	6,368	31.1
	66,871	6,368	31.7
Q	67,896	1,897	32.0
	68,557	1,897	32.1
	69,058	1,897	32.1
	69,934	1,897	32.1
R	71,012	1,897	32.3
	71,865	1,897	32.6
	72,962	1,897	33.6
	74,008	1,897	34.9
S	74,953	1,897	36.2
	75,726	1,897	37.0
	76,472	1,897	38.1
	77,481	1,897	39.5
T	78,309	1,897	40.7

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
PINE LOG CREEK – cont.			
	79,330	1,897	42.1
	80,038	1,897	42.8
	81,063	1,897	43.5
	82,044	1,897	43.7
U	82,840	1,897	43.8
	83,536	1,897	43.9
	84,217	1,897	44.0
V	84,919	1,897	44.1
	85,687	1,897	44.1
	86,551	1,897	44.2
	87,449	1,897	44.3
PINEY BRANCH			
	1	1,500	40.0 ³
	665	1,485	40.0 ³
	1,421	1,485	40.0 ³
	2,062	1,485	40.0 ³
	2,607	1,485	40.0 ³
	3,279	1,485	40.0 ³
	3,676	1,485	40.0 ³
	4,004	1,485	40.0 ³
	4,092	754	40.0 ³
A	4,179	749	40.0 ³
B	4,326	746	40.0 ³
	5,039	739	42.8
C	6,026	717	44.3
D	6,945	708	46.1
	7,657	708	48.7
E	8,197	708	49.9
F	8,673	708	51.2
G	9,626	708	54.6
H	10,477	708	56.3
I	11,167	708	57.8
J	12,111	708	59.9
K	13,105	694	62.0

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
PINEY BRANCH – cont.			
L	13,571	694	63.3
M	13,669	694	63.8
N	14,038	694	64.6
O	14,653	680	66.5
P	15,877	680	71.6
Q	17,049	636	74.4
R	17,754	383	76.2
S	18,483	383	79.3
T	19,584	275	84.4
U	20,644	275	88.3
	22,317	275	95.8
V	22,464	275	97.1
	22,539	275	97.4
W	22,707	275	98.7
	22,809	275	99.1
X	22,972	275	99.4
	23,035	275	99.4
Y	23,288	275	100.7
Z	24,333	258	105.6
	24,505	258	106.9
AA	24,565	258	108.6
AB	24,900	258	108.6
AC	26,260	258	115.3
AD	26,880	258	119.8
AE	27,519	258	120.4
AF	28,298	258	126.2
AG	29,394	258	135.0
AH	29,746	258	137.6
AI	29,912	258	155.2
AJ	30,289	258	155.2
AK	31,245	258	155.2
AL	32,024	258	157.7
AM	32,669	258	180.1
AN	32,985	258	183.2

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
PINEY BRANCH – cont.			
AO	34,045	258	190.0
AP	34,951	258	193.4
PIPPIN MILL CREEK			
	1,536	2,126	37.0 ³
	1,750	2,126	37.0 ³
	1,978	2,126	37.0 ³
	2,103	2,126	37.0 ³
A	2,219	2,126	37.0 ³
B	2,348	2,126	37.0 ³
C	3,102	1,960	37.0 ³
D	3,648	1,960	37.6
E	4,453	1,960	38.3
F	5,252	1,960	39.9
G	5,934	1,960	41.3
H	6,406	1,960	42.9
I	6,910	1,960	44.0
J	7,361	1,960	44.9
K	7,820	1,960	46.1
L	8,360	1,960	47.8
M	9,001	1,662	50.3
N	10,017	1,662	53.6
	11,032	1,662	56.8
O	11,875	1,662	57.8
P	12,433	1,662	58.2
Q	13,138	1,662	60.0
R	13,347	1,662	61.4
S	13,411	1,662	65.4
T	13,594	1,662	65.4
U	14,423	1,662	65.5
V	15,396	1,662	67.8
W	16,110	1,662	69.2
X	17,014	1,662	71.0
Y	17,737	1,320	75.4
Z	18,679	1,320	76.4

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² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
PIPPIN MILL CREEK – cont.			
AA	19,565	1,320	77.5
AB	20,304	1,320	80.1
AC	21,362	1,320	82.3
AD	22,456	1,385	85.4
AE	23,496	1,385	87.8
AF	24,346	1,385	88.2
AG	25,694	1,385	88.4
AH	26,666	1,385	90.5
AI	27,396	914	93.0
AJ	28,739	914	95.3
REEDY CREEK			
A	1,001	3,567	58.6
	2,773	3,567	60.0
B	4,061	2,390	61.2
	4,800	2,390	62.6
C	5,293	2,390	63.9
D	5,429	2,390	69.4
	5,716	2,390	69.4
	6,206	2,390	69.4
E	6,780	2,390	69.4
F	6,905	2,390	70.3
	7,312	2,390	70.4
G	8,164	2,390	70.5
H	9,114	2,390	73.2
	9,550	2,390	73.6
I	10,030	2,390	74.6
J	10,258	2,390	79.2
	10,573	2,390	79.2
	11,121	2,390	79.3
K	11,720	2,390	79.3
L	12,058	1,623	82.3
	12,540	1,623	82.3
M	13,122	1,623	82.3
	14,385	1,623	82.4

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
REEDY CREEK – cont.			
N	16,495	1,623	86.5
	17,622	1,623	94.2
O	18,077	1,623	96.2
P	18,223	1,623	101.5
	18,759	1,144	101.5
Q	19,861	991	104.5
UNNAMED TRIBUTARY 1 to ALLIGATOR CREEK			
A	765 ⁵	276	67.6
B	1,275 ⁵	276	76.1
C	1,834 ⁵	276	78.0
D	2,166 ⁵	276	78.3
E	2,586 ⁵	276	82.4
F	3,003 ⁵	276	84.4
G	3,428 ⁵	276	86.5
H	3,911 ⁵	276	90.4
I	4,517 ⁵	121	91.6
J	4,863 ⁵	121	93.8
K	5,219 ⁵	121	99.8
	5,667 ⁵	121	106.6
	5,863 ⁵	121	111.5
L	5,921 ⁵	121	114.6
	5,942 ⁵	121	114.6
M	5,969 ⁵	121	114.6
	6,077 ⁵	121	114.7
N	6,136 ⁵	121	116.5
	6,267 ⁵	121	117.2
O	6,364 ⁵	121	120.7
P	6,648 ⁵	121	120.7
Q	6,888 ⁵	121	120.7
R	7,112 ⁵	121	120.7
S	7,344 ⁵	121	120.7
UNNAMED TRIBUTARY 2 to ALLIGATOR CREEK			
	108	748	72.0 ³
	758	748	72.0 ³

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
UNNAMED TRIBUTARY 2 to ALLIGATOR CREEK – cont.			
	1,334	748	72.0 ³
	2,039	748	72.0 ³
A	2,720	748	72.0 ³
B	3,090	748	72.5
C	3,389	748	73.3
	3,649	748	73.6
D	3,692	748	75.8
E	4,076	748	75.9
F	4,550	748	75.9
G	4,874	748	79.3
	5,003	224	82.2
H	5,359	224	82.3
I	5,700	104	82.3
J	6,020	104	82.3
	6,139	104	82.3
	6,205	104	82.9
K	6,359	104	82.9
L	6,637	104	82.9
M	7,062	104	83.0
	7,498	104	84.1
N	7,858	104	84.8
	7,925	104	86.9
O	7,928	104	86.9
	7,955	104	86.9
P	8,016	104	89.7
Q	8,390	104	89.7
R	8,958	104	92.9
S	9,393	104	95.2
T	9,794	104	97.7
U	10,305	104	100.7
V	10,766	104	101.8
W	11,245	104	104.2
	11,373	104	105.9
X	11,580	104	110.5

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
UNNAMED TRIBUTARY 2 to ALLIGATOR CREEK – cont.			
Y	11,790	104	110.5
UNNAMED TRIBUTARY 3 to ALLIGATOR CREEK			
A	1,020	335	75.9 ³
B	1,820	335	75.9 ³
C	2,803	335	75.9 ³
D	3,736	335	75.9 ³
E	4,530	335	75.9 ³
F	4,672	335	75.9 ³
G	4,741	335	78.2
	4,867	335	78.2
	5,248	335	78.4
H	5,381	335	78.7
I	5,466	335	81.7
	5,669	335	81.7
	5,887	335	78.3
J	6,225	335	81.8
	6,701	335	81.8
K	6,795	335	82.8
L	6,873	335	84.9
	7,064	335	84.9
	7,306	335	84.9
M	7,549	335	84.9
	7,686	335	85.0
	7,734	335	87.0
N	7,810	335	87.0
	8,133	335	87.0
O	8,339	335	87.1
	8,450	335	87.2
	8,519	335	87.6
P	8,620	335	87.6
	8,851	335	87.6
	9,071	335	87.6
Q	9,228	335	89.6
	9,360	335	91.3

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
UNNAMED TRIBUTARY 3 to ALLIGATOR CREEK - cont.			
	9,424	335	96.3
R	9,542	267	96.3
	9,683	267	101.4
S	9,820	267	101.4
	9,957	267	101.4
	10,065	267	101.4
	10,331	267	101.5
T	10,498	267	101.5
UNNAMED TRIBUTARY to HELMS BRANCH			
A	3,307 ⁶	174	116.6
B	3,527 ⁶	174	118.5
	3,580 ⁶	174	119.4
C	3,644 ⁶	174	123.3
D	3,769 ⁶	164	123.3
	4,137 ⁶	164	123.3
E	4,467 ⁶	164	123.4
	4,791 ⁶	164	123.4
F	5,030 ⁶	164	125.0
	5,191 ⁶	164	126.1
	5,342 ⁶	164	127.4
G	5,709 ⁶	164	128.6
	5,989 ⁶	164	129.0
H	6,328 ⁶	164	129.9
I	6,643 ⁶	164	130.7
UNNAMED TRIBUTARY to HOLMES CREEK			
	1	1,389	36.0 ³
	533	1,389	36.0 ³
	1,001	1,389	36.0 ³
	1,317	1,389	36.0 ³
	1,487	1,389	36.0 ³
	1,562	1,389	37.0
	1,702	1,389	37.3
	2,015	1,389	38.0
	2,288	1,389	38.5

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
UNNAMED TRIBUTARY to HOLMES CREEK – cont.			
A	2,737	1,389	39.2
B	3,046	1,389	39.4
	3,212	1,389	39.7
C	3,287	1,389	41.2
	3,418	1,389	41.6
D	3,818	422	41.9
E	4,223	422	41.9
F	4,504	422	42.1
	4,640	422	42.3
	4,695	422	42.4
G	4,800	422	42.5
	4,901	422	42.6
	5,007	422	42.7
H	5,055	422	44.1
	5,205	422	44.1
I	5,556	422	44.7
J	5,943	422	45.3
	6,093	422	45.5
K	6,147	422	47.4
	6,437	422	47.7
L	6,728	422	48.7
	7,057	422	51.1
M	7,170	422	51.7
	7,435	422	51.7
N	8,032	422	51.8
O	8,802	422	51.9
	9,292	422	52.3
P	10,072	422	52.4
Q	10,797	252	52.4
R	11,622	252	52.4
UNNAMED TRIBUTARY to HOLMES CREEK EAST BRANCH			
	1	1,298	41.8 ³
	59	1,298	41.8 ³
	125	1,106	41.8

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

Table 4 – Limited Detailed Flood Hazard Data

Cross Section¹	Stream Station²	Flood Discharge (cfs)	1% Annual Chance Water Surface Elevation (feet NAVD 88)
UNNAMED TRIBUTARY to HOLMES CREEK EAST BRANCH – cont.			
A	259	1,106	42.0
B	711	1,106	42.5
C	1,452	1,106	44.3
	2,132	1,106	45.3
D	2,477	1,106	45.7
E	2,582	1,106	47.7
F	2,844	1,106	47.8
G	3,757	1,106	48.9
H	4,496	1,106	49.9
I	4,966	1,106	51.4
J	5,585	1,106	53.2
K	6,202	1,106	54.3
L	6,685	1,106	55.1

¹ This table reflects all modeled cross sections. Some cross sections shown in this table may not appear on the map.

² Feet above mouth or confluence.

³ Elevation includes backwater effects.

⁴ Elevation includes flooding controlled by effects.

⁵ Feet above Highway 277.

⁶ Feet above Orange Hill Road.

3.3 Vertical Datum

All FISs and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FISs and FIRMS was NAVD 29. With the finalization of the NAVD 88, many FIS reports and FIRMs are being prepared using NAVD 88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD 88. Structure and ground elevations in the community must, therefore, be referenced to NAVD 88. It is important to note that adjacent communities may be referenced to NAVD 29. This may result in differences in Base Flood Elevations (BFEs) across the corporate limits between the communities.

Prior versions of the FIS report and FIRM were referenced to NAVD 29. When a datum conversion is effected for an FIS report and FIRM, the Flood Profiles, BFEs, and Elevation Reference Marks (ERMs) reflect the new datum values. To compare structure and ground elevations to 1 percent annual chance flood elevations shown in the FIS and on the FIRM, the subject structure and ground elevations must be referenced to the new datum values.

As noted above, the elevations shown in the FIS report and on the FIRM for Washington County and incorporated areas are referenced to NAVD 88. Ground, structure, and flood elevations may be compared and/or referenced to NAVD 29 using a standard conversion factor. The conversion factor from NAVD 29 to NAVD 88 is -0.35 feet. The BFEs shown on the FIRM represent whole-foot rounded values. For example a BFE of 102.4 will appear as 102 on the FIRM and 102.6 will appear as 103. Therefore, users that wish to convert the elevations in this FIS to NAVD 29 should apply the stated conversion factor(s) to elevations shown on the Flood Profiles and supporting data tables in the FIS report, which are shown at a minimum to the nearest 0.1 foot.

For more information on NAVD 88, see [Converting the National Flood Insurance Program to the North American Vertical Datum of 1988](#), FEMA Publication FIA20/June 1992, or contact the National Geodetic Survey (NGS) Information Services, NOAA N/NGS12, National Geodetic Survey, SSMC-3, #9202, 1315 East-West Highway, Silver Spring, Maryland 20910-3282 (Internet address <http://www.ngs.noaa.gov>).

4.0 **FLOODPLAIN MANAGEMENT APPLICATIONS**

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS provides 1 percent annual chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2- percent annual chance flood elevations; delineations of the 1-percent and 0.2-percent annual chance floodplains; and 1-percent annual chance floodway. This information is presented on the

FIRM and in many components of the FIS, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent annual chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent annual chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 1- and 0.2-percent annual chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using a digital elevation model of Washington County developed from 0.7-meter LiDAR data.

The 1- and 0.2-percent annual chance floodplain boundaries are shown on the FIRM. On this map, the 1-percent annual chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A, AE, AH, AO, A99, V, and VE), and the 0.2-percent annual chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent annual chance floodplain boundaries are close together, only the 1-percent annual chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1 percent annual chance floodplain boundary was delineated using topographic maps (USGS, 7.5 Minute Series Topographic Maps).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces the flood-carrying capacity, increases the flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1-percent annual chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways for this study were computed for certain stream segments on the basis of equal conveyance reduction from each side of the floodplain. Floodway

widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections and are shown in Table 5 – “Floodway Data.” The computed floodways are shown on the FIRM (Exhibit 2). In cases where the floodway and 1-percent annual chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The Unnamed Tributary 1 to Alligator Creek study reach comprises a segment of the creek beginning at an area located west of the intersection of State Highway 277 and Brickyard Road near Chipley, Florida and going upstream approximately 1.24 miles in length to an unnamed pond located southwest of the intersection of Hutchinson Road and Sorrells Road near Chipley, Florida. The channel and floodplain areas throughout the study reach are primarily forested with an average channel slope of about 44 feet per mile. The channel, which has a sandy bottom in the upper reach as well as Bladen and Bayboro soils at the bottom in the lower reach, is characterized by heavily vegetated banks, some local obstructions and minor to appreciable meander. The overbank areas are heavy vegetated with trees and underbrush causing a high degree of roughness. This reach has two culvert crossings.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SECOND)	REGULATORY (FEET NAVD88)	WITHOUT FLOODWAY (FEET NAVD88)	WITH FLOODWAY (FEET NAVD88)	INCREASE (FEET)
ALLIGATOR CREEK								
A	2,450 ¹	1,138	7,047	1.5	62.7	61.5 ³	62.5	1.0
B	7,000 ¹	1,094	7,747	1.3	65.3	65.3	66.3	1.0
C	10,188 ¹	828	5,687	1.8	66.5	66.5	67.3	0.8
D	10,352 ¹	918	6,652	1.5	66.7	66.7	67.4	0.7
E	13,644 ¹	970	5,866	1.7	67.6	67.6	68.6	1.0
F	17,944 ¹	615	5,215	2.0	71.5	71.5	72.3	0.8
HOLMES CREEK								
A	1.5 ²	764	14,376	1.3	30.3	27.9 ⁴	28.9	1.0
B	4.2 ²	1,098	17,866	1.1	30.3	28.4 ⁴	29.4	1.0
C	5.7 ²	558	11,836	1.6	30.3	28.7 ⁴	29.7	1.0
D	7.6 ²	1,880	28,324	0.7	30.3	29.0 ⁴	30.0	1.0
E	8.8 ²	2,050	29,689	0.6	30.3	29.2 ⁴	30.2	1.0
F	11.8 ²	911	14,550	1.3	30.3	30.2 ⁴	31.2	1.0
G	13.3 ²	1,733	25,401	0.7	31.0	31.0	32.0	1.0
H	15.4 ²	1,809	25,584	0.7	31.6	31.6	32.6	1.0
I	17.1 ²	1,379	14,998	1.2	32.3	32.3	33.3	1.0
J	19.0 ²	1,095	13,071	1.3	34.1	34.1	35.1	1.0
K	21.6 ²	1,560	19,540	0.9	35.9	35.9	36.9	1.0
L	22.8 ²	1,151	14,119	1.2	36.4	36.4	37.4	1.0
M	23.8 ²	994	12,231	1.4	36.8	36.8	37.8	1.0
N	25.0 ²	789	10,823	1.6	37.5	37.5	38.5	1.0

¹ Feet above mouth.

² Miles above Boynton Cutoff.

³ Elevation computed without consideration of overflow effects from Holmes Creek.

⁴ Elevation computed without consideration of backwater effects from Choctawhatchee River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, FL
AND INCORPORATED AREAS

FLOODWAY DATA

ALLIGATOR CREEK- HOLMES CREEK

The area between the floodway and the 1-percent annual chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water surface elevation of the 1 percent annual chance flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

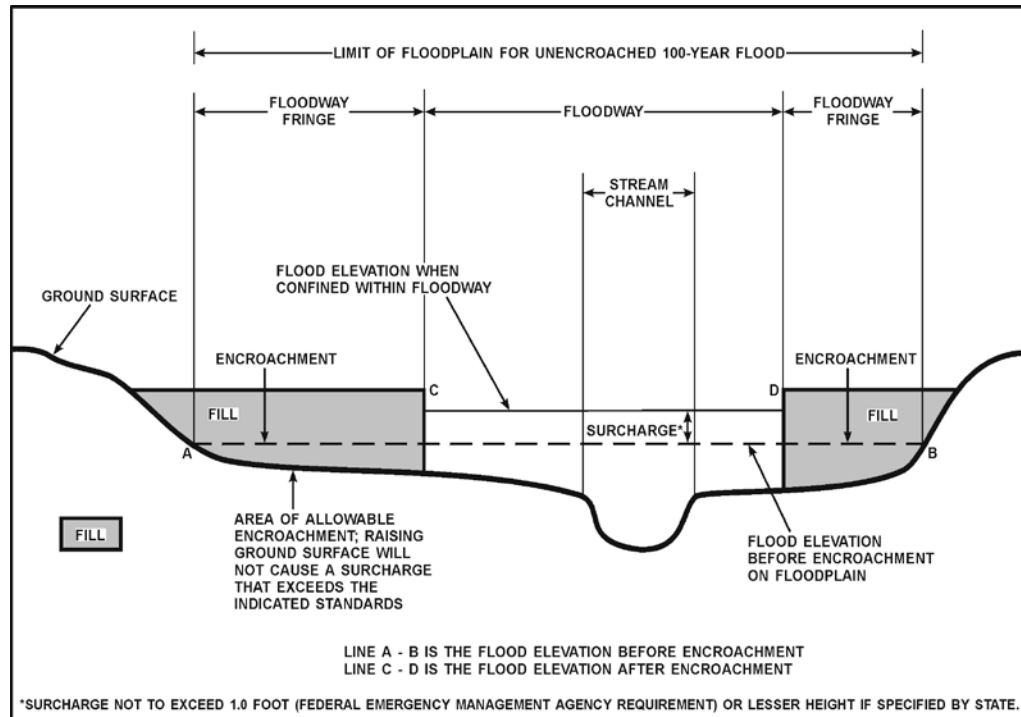


FIGURE 1 - FLOODWAY SCHEMATIC

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1 percent annual chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1- percent annual chance floodplains that are determined in the FIS by detailed methods or limited detailed methods. Whole-foot BFEs derived from the detailed or limited detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 1-percent annual chance floodplain, areas of 1-percent annual chance flooding where average depths are less than 1 foot, areas of 1-percent annual chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent annual chance flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designated flood insurance rate zones as described in Section 5.0 and in the 1-percent annual chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols the 1- and 0.2-percent annual chance floodplains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The current FIRM presents flooding information for the entire geographic area of Washington County. Previously, separate Flood Hazard Boundary Maps and/or FIRMS were prepared for each identified floodprone incorporated community and the unincorporated areas of the county. This countywide FIRM also includes flood hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community, up to and including this countywide FIS, are presented in Table 6 – “Community Map History.”

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISIONS DATE	FIRM EFFECTIVE DATE	FIRM REVISIONS DATE
Caryville, Town of	June 28, 1974	February 20, 1976	February 4, 1988	
Chipley, City of	July 26, 1974	January 30, 1976	January 1, 1987	
Ebro, Town of	June 7, 1990	None	June 17, 1991	
Vernon, City of	June 28, 1974	March 19, 1976	June 17, 1991	
Wausau, Town of	December 14, 1989	None	June 17, 1991	
Washington County (Unincorporated Areas)	November 4, 1977	None	June 17, 1991	

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

**WASHINGTON COUNTY, FL
AND INCORPORATED AREAS**

COMMUNITY MAP HISTORY

7.0 OTHER STUDIES

The FISs published for Walton, Bay, Holmes, and Jackson Counties, Florida (FEMA, 2010, 2009, and 1990), agree with this study.

Information pertaining to revised and unrevised flood hazards for each jurisdiction within Washington County, Florida has been compiled into this FIS. Therefore, this FIS supersedes all previously printed FIS reports, FIRMS, and FBFMs for all jurisdictions within Washington County, Florida.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this FIS can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, Koger Center – Rutgers Building, 3003 Chamblee Tucker Road, Atlanta, Georgia 30341.

9.0 REFERENCES AND BIBLIOGRAPHY

Federal Emergency Management Agency, Flood Insurance Rate Map, City of Chipley, Washington County, Florida, January 1987.

-----, Flood Insurance Rate Map, City of Vernon, Washington County, Florida, January 1987.

-----, Flood Insurance Study, Bay County, Florida and Incorporated Areas, June 2009.

-----, Flood Insurance Study, City of Caryville, Washington County, Florida, February 1988.

-----, Flood Insurance Study, Holmes County, Florida and Incorporated Areas, December 1990.

-----, Flood Insurance Study, Jackson County, Florida and Incorporated Areas, December 1990.

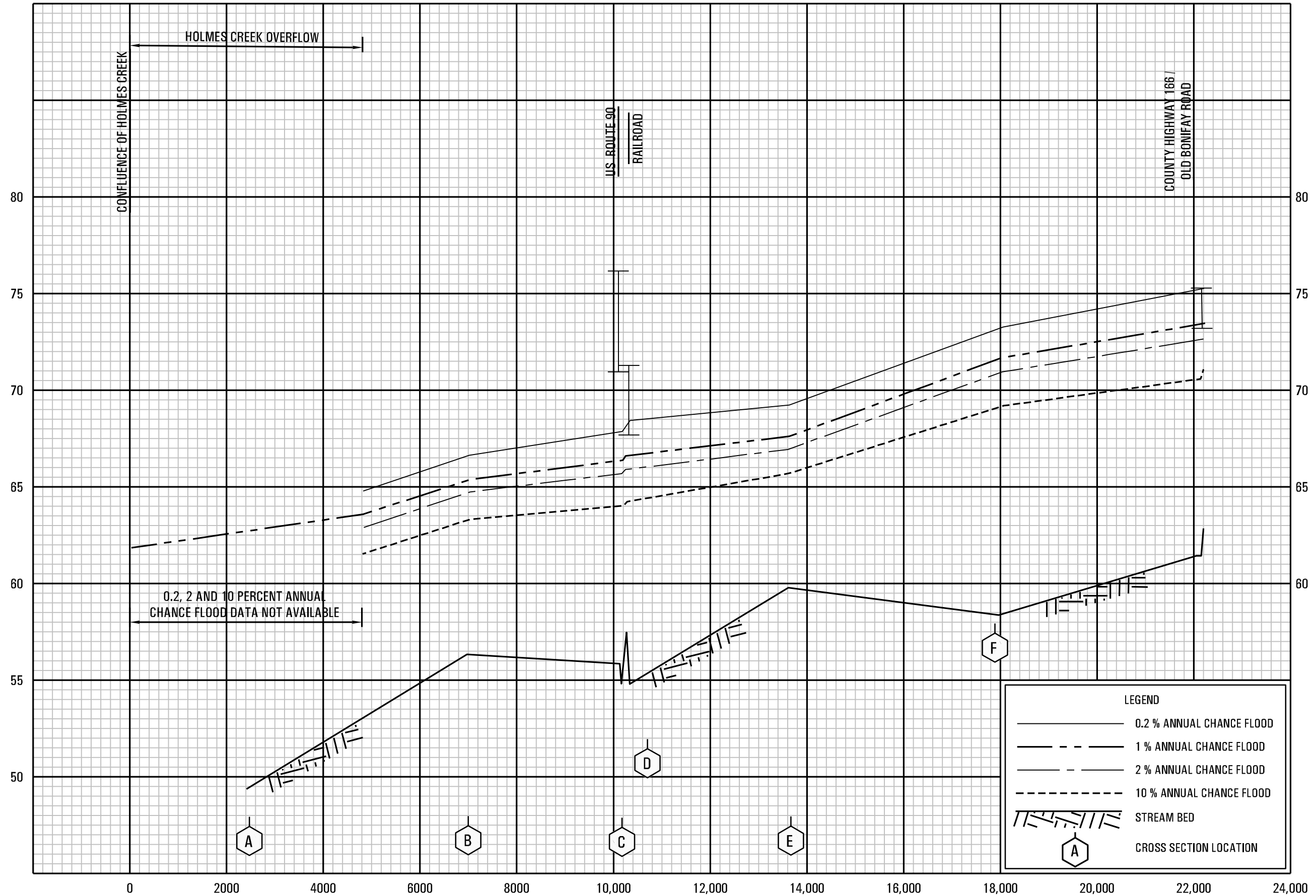
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- , Limited Detail Flood Insurance Study, City of Graceville, Jackson County, Florida, August 1985.

ELEVATION IN FEET (NAVD 88)



STREAM DISTANCE IN FEET ABOVE MOUTH

FLOOD PROFILES

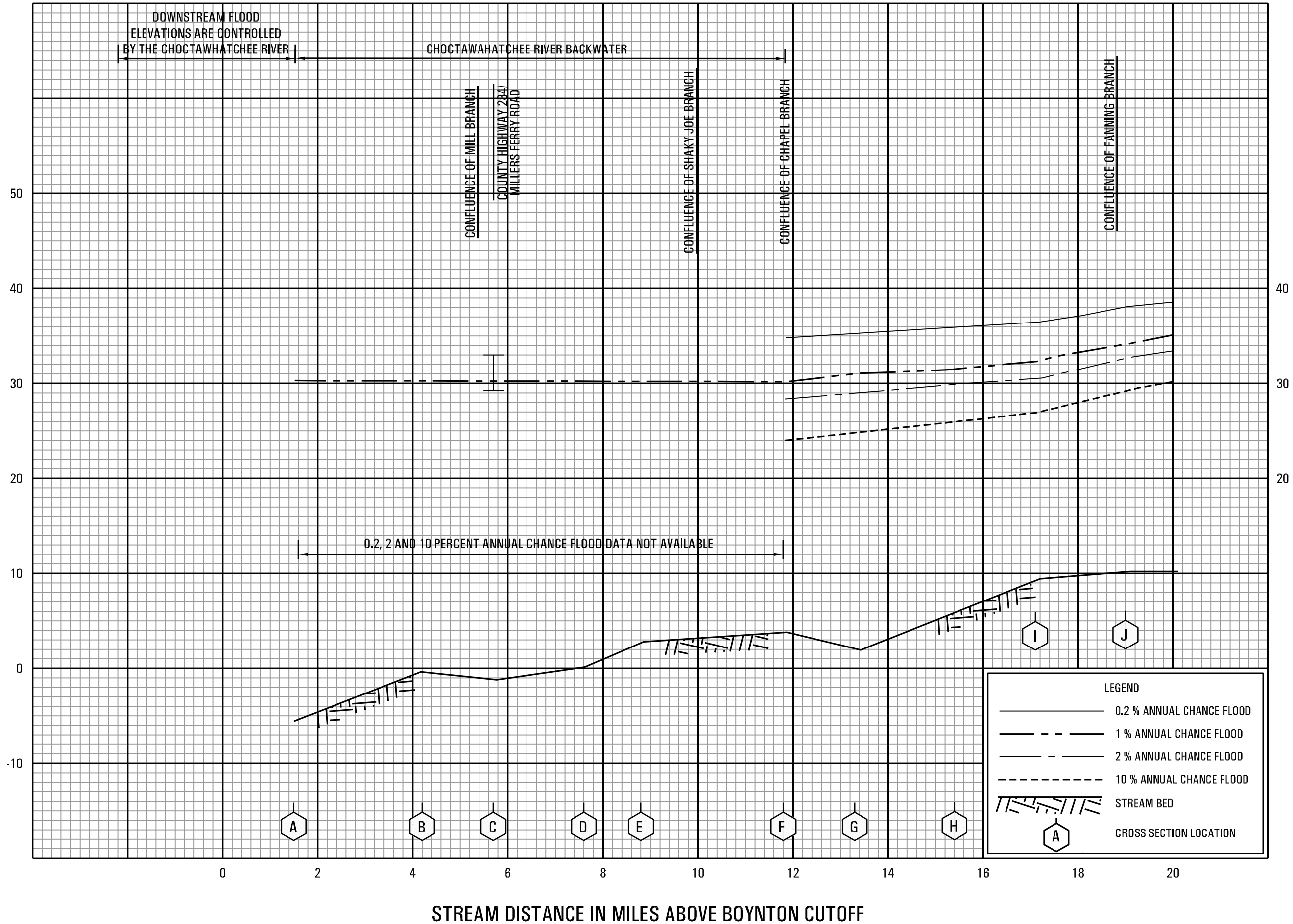
ALLIGATOR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, FL
AND INCORPORATED AREAS

01P

ELEVATION IN FEET (NAVD 88)



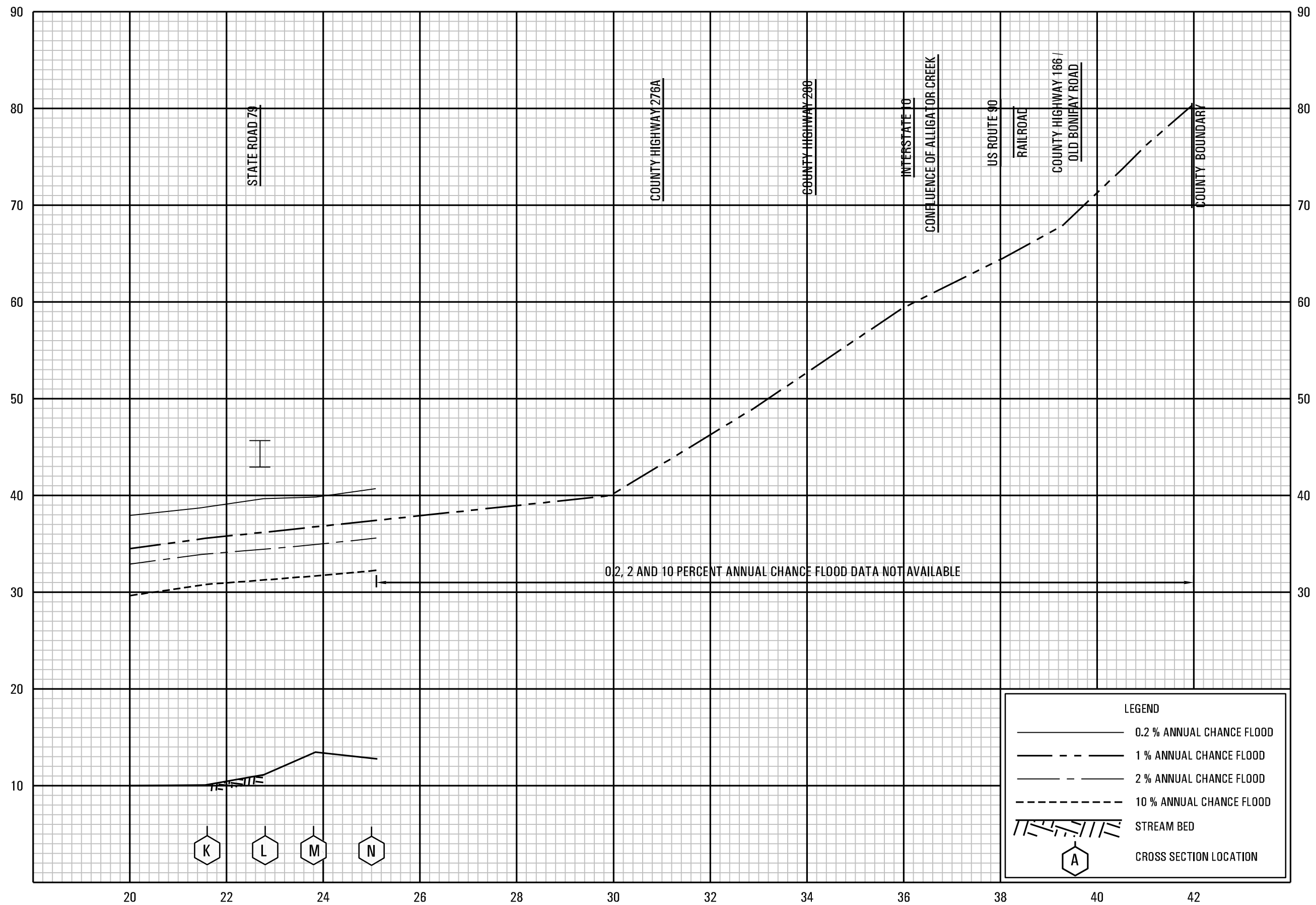
FLOOD PROFILES

HOLMES CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

WASHINGTON COUNTY, FL
AND INCORPORATED AREAS

Q4P



LEGEND

	0.2 % ANNUAL CHANCE FLOOD
	1 % ANNUAL CHANCE FLOOD
	2 % ANNUAL CHANCE FLOOD
	10 % ANNUAL CHANCE FLOOD
	STREAM BED
	CROSS SECTION LOCATION

WASHINGTON COUNTY, FL
AND INCORPORATED AREAS

05P